



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Akira Hasegawa, et al

Serial No.: 09/832,209

Group Art Unit: 1755

Filed: April 11, 2001

Examiner: Group, Karl E

For: GLASS PASTE

## DECLARATION UNDER 37 C.F.R. §1.132

Honorable Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

I, Tetsu Umeda, a Japanese citizen residing at 2-13-1, Umezono, Tsukuba-shi, Ibaraki, Japan, declare:

That I graduated Kyoto University, Department of Molecular Engineering, master degree, in March 1990, and entered Sumitomo Chemical Company Limited in April, 1990, in which company I have since then been engaged in research for technology of inorganic material;

That I am familiar with the prosecution history of the identified application;

That the following experiment was conducted by me or under my direction.

### Object of the Experiment

An object of the present experiment is to show that a glass composition disclosed in USP 4,071,881 is different from a glass paste as claimed in the present application.

### Experimental 1.

A glass having the same composition to USP 4,071,881 was prepared as follows:

40wt% of silica ( $\text{SiO}_2$ ), reagent grade, manufactured by Wako Pure Chemical Industries, Ltd., 23.2wt% of barium carbonate ( $\text{BaCO}_3$ ), reagent grade, manufactured by Kanto Kagaku, 8.9wt% of calcium carbonate ( $\text{CaCO}_3$ ), reagent grade, manufactured by Wako Pure Chemical Industries, Ltd., 10.7wt% of boric acid ( $\text{H}_3\text{BO}_3$ ), reagent grade, manufactured by Wako Pure Chemical Industries, Ltd., 10wt% of alumina ( $\text{Al}_2\text{O}_3$ ), trade name: AKP-30, manufactured by Sumitomo Chemical Co., Ltd., 5wt% of magnesia ( $\text{MgO}$ ), reagent grade, manufactured by Wako Pure Chemical Industries, Ltd., 8wt% of zinc oxide ( $\text{ZnO}$ ), reagent grade, manufactured by Wako Pure Chemical Industries, Ltd., 8wt% of lead oxide ( $\text{PbO}$ ), reagent grade, manufactured by Kanto Kagaku, were weighed and charged into a polyethylene vessel having a volume of 1L. 1kg of plastic balls containing iron core having a diameter of 15 mm were added into the vessel, and ball mill mixing was conducted under dry condition for 20 hours. 10g of the mixed powder was set into a platinum crucible and heated at  $1500^\circ\text{C}$  to get a molten mixture. Then the molten mixture was quenched by pouring into water. During heating, barium carbonate ( $\text{BaCO}_3$ ), calcium carbonate ( $\text{CaCO}_3$ ) and boric acid ( $\text{H}_3\text{BO}_3$ ) changed into barium oxide ( $\text{BaO}$ ), calcium oxide ( $\text{CaO}$ ) and boron oxide ( $\text{B}_2\text{O}_3$ ), respectively, so a resulting solid was a transparent glass having the same composition to USP 4,071,881: 40%  $\text{SiO}_2$ , 18%  $\text{BaO}$ , 5%  $\text{CaO}$ , 6%  $\text{B}_2\text{O}_3$ , 10%  $\text{Al}_2\text{O}_3$ , 5%  $\text{MgO}$ , 8%  $\text{ZnO}$ , and 8%  $\text{PbO}$ . Then the glass was ground into powder.

The glass transition temperature of the glass composition thus obtained was measured by DSC (Differential Scanning Calorimetry). A temperature rising speed was  $10^\circ\text{C}/\text{min}$ . DSC curve thereof is as shown in

Figure 1. The glass transition temperature is defined as a cross point of a base line of DSC curve and a beginning of endothermal peak cause of glass transition. It was found that the glass transition temperature of the resulted glass composition was 593°C.

#### Experimental 2.

Glass powder (trade name: ASF-1340, manufactured by Asahi Glass Co., Ltd., containing 70wt% PbO, glass transition temperature of 420°C, glass softening temperature of 505°C in Asahi Glass catalog) that is used in Examples of the present specification, was measured by DSC under same conditions as Experimental 1. DSC curve thereof is as shown in Figure 1. It was found that the glass transition temperature of the resulted glass composition was 427°C.

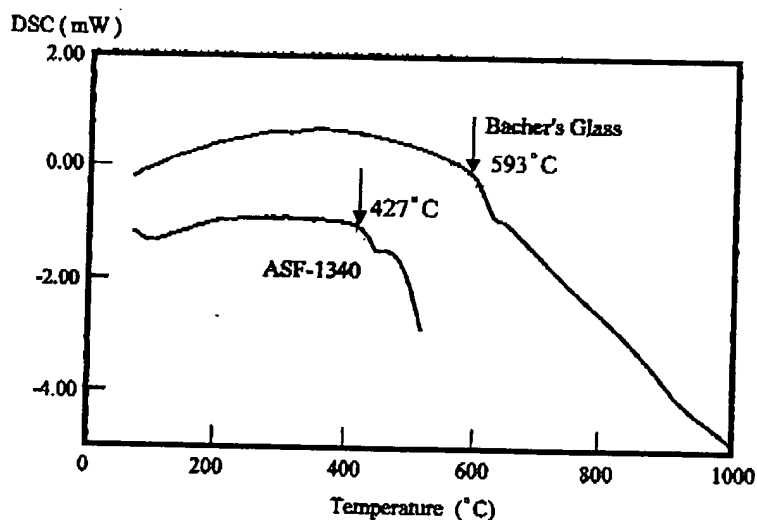


Figure 1 DSC curves

#### Conclusion.

From the results shown above, it is apparent that the glass composition disclosed in USP 4,071,881 has a glass transition temperature of more than 500°C.

Accordingly, the glass composition disclosed in USP 4,071,881 is

different from a glass paste having a glass transition temperature of 500°C or less as claimed in the present application.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above identified application or patent issued thereon.

Date: December 2, 2003

Tetsu Umeda

Tetsu Umeda